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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/500,325 | 06/28/2004 | Hiroshi Aruga | 032404-079 | 8943 |
| 21839 7590 03/10/2008 BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404 | | | | |
| EXAMINER VAN ROY, TOD THOMAS | | | | |
| ART UNIT 2828 | | PAPER NUMBER | | |
| NOTIFICATION DATE 03/10/2008 | | DELIVERY MODE ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary

Application No.

10/500,325

Applicant(s)

ARUGA ET AL.

Examiner

TOD T. VAN ROY

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 06/28/04, 02/23/06, 10/15/07
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Figures 9A/B, and 18-21 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5, and 12-18 are rejected under 35 U.S.C. 102(b) as being anticipated by NAGAHORI, Takeshi et al. (applicant submitted prior art, "An Analog Front-End Chip Set Employing an Electro-Optical Mixed Design on SPICE for 5-Gb/s/ch

Parallel Optical Interconnection." IEEE Journal of Solid-State Circuits. Volume 36, No. 12. pp 1984-1991. December 2001).

With respect to claims 1 and 12, Takeshi discloses an optical semiconductor device comprising: an optical semiconductor element (fig.4 LD, laser diode); a first conductor line connected to one electrode of a pair of electrodes of the optical semiconductor element and supplying an electric signal to the optical semiconductor element (fig.4 top connection to anode); a second conductor line connected to the other electrode of the pair of electrodes of the optical semiconductor element and supplying an electric signal to the optical semiconductor element (fig.4 bottom connection to cathode); a first inductance element connected to the one electrode of the optical semiconductor element and the first conductor line (fig.4); and a second inductance element connected to the other electrode of the optical semiconductor element and the second conductor line (fig.4), wherein the first and the second conductor lines constitute a pair of differential lines (as they come from differential driving amp formed via Q1/Q2).

With respect to claim 2, Takeshi discloses a pair of matching resistors connected to one electrode and the other electrode of the optical semiconductor element (fig.4 R1/R2), and an electrical signal generating unit (fig.4 current sources).

With respect to claim 5, Takeshi discloses a filter that cuts off frequencies higher than at least a maximum repetition frequency of a digital signal (no value defined), the filter provided between the first and second conductor lines and the pair of matching resistors (fig.4 low pass filters provided via the inductors).

With respect to claim 13, Takeshi discloses impedances of at least two bias circuits are set asymmetric (as the bias circuits have not been defined any combination of components in fig.4 can be combined into two separate bias circuits having differing impedance values).

With respect to claims 14-17, Takeshi discloses the device of claim 1, and additionally the differential driving circuit would provide inputs opposite in phase (constituting a push-pull operation), and the inductive elements would act as high frequency filters (can be called a bias circuit).

Claim 18 is rejected for the same reasons outlined above for the rejection of claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ciubotaru et al. (US 2003/0086455).

With respect to claims 3-4, Takeshi teaches the device outlined in the rejection to claim 1, but does not teach a resistor in parallel with the inductor. Ciubotaru teaches a differential driving circuit utilizing a resistor in parallel with an inductor (fig.3). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Takeshi with the parallel resistor/inductor combination of Ciubotaru in order to reduce resonance effects in the circuit ([0016]).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi in view of Ito et al. (US 4975664).

With respect to claim 6, Takeshi teaches the device outlined in the rejection to claim 5, but does not teach the filter type to be of the comb-like variety. Ito teaches the use of a comb-type filter. It would have been obvious to one of ordinary skill in the art at the time of the invention to add the additional comb-type filter of Ito to the circuit of Takeshi in order to add the ability to tune the amount of filtering done via the circuit (Ito abs.).

Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi and Ito in view of Kobayashi et al. (US 5982793).

With respect to claims 7 and 9-10, Takeshi and Ito teach the laser diode driving device outlined in the rejection to claim 6, but do not teach the use of a packaging

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structure. Kobayashi teaches the use of a packaging structure having a lens and an optical fiber holding means (fig.2). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Takeshi and Ito with the package of Kobayashi in order to protect the device and provide a method to allow for information transmission.

With respect to claims 8 and 11, Takeshi and Ito do not disclose the particular inductors claimed. However these inductor types are well known in the circuit arts. The particular inductor used in Takeshi does not appear critical to the operation of the device, therefore it would have been obvious to one skilled in the art to substitute the known air coil inductor into the system of Takeshi by an obvious engineering design choice.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TVR/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828